I CLAIM AS MY INVENTION:

1. A method of starting up a catalytic process comprising a fluidized reactor zone containing one or more cyclones requiring a minimum superficial gas velocity in order to function properly and a motor-driven product compression zone that is sized to handle only about 20 to 60 vol-% of the reaction zone effluent gas stream at design capacity and that cannot during start-up provide the required superficial gas velocity for the one or more cyclones where the start-up is conducted without the use of an additional motor-driven start-up compressor and with the use of a thermal compressor having a motive gas inlet, a suction gas inlet, and a discharge gas outlet, the start-up method comprising the steps of:

a) charging the reaction zone with an inert start-up gas in an amount sufficient to provide an effluent gas stream for recirculation;
b) passing a first portion of the resulting effluent gas stream to the product compression zone and compressing it therein to provide a high pressure gas stream;
c) heating at least a first portion of the high pressure gas stream, charging the resulting heated high pressure gas stream to the motive gas inlet of the thermal compressor to produce a discharge gas stream and recycling the resulting discharge gas stream from the thermal compressor back to the reaction zone thereby establishing a first start-up gas circuit;

d) passing a second portion of the effluent gas stream from step a) directly to the suction gas inlet of the thermal compressor, compressing the second portion using energy contained in the motive gas and passing the resulting compressed gas into the discharge gas stream thereby establishing a second start-up gas circuit;

e) increasing the temperature of the heated high pressured gas stream until the temperature of the reaction zone reaches at least about 300° to 400°C (572° to 752°F);

f) increasing the pressure of the discharge gas stream until the pressure differential across the reaction zone is sufficient to drive the discharge gas stream there through at a velocity which meets or exceeds the minimum cyclone superficial gas velocity;

g) start circulating catalyst particles in the reactor zone using the discharge gas stream from the thermal compressor as the fluidizing gas and charging a minor amount of feed to the reaction zone while passing a commensurate second portion of the high pressure gas stream produced in step b) to a product recovery zone; and

h) increasing the amount of feed passed to the reaction zone while simultaneously decreasing the amount of the first portion of the high pressure gas stream passed into the first start-up gas circuit until the desired flow rate of the feed into the reaction zone is established and the thermal compressor is blocked off.

2. The start-up method as defined in claim 1 wherein the inert start-up gas is selected from the group consisting of nitrogen, hydrogen, carbon dioxide, argon, neon, helium, methane, ethane and mixtures thereof.

3. The start-up method as defined in claim 1 wherein high pressure steam is injected into the motive gas inlet of the thermal compressor in admixture with the heated high pressure gas stream once the temperature of the MTO reaction zone reaches a level of about 300° to 400°C (572° to 752°F).

4. The start-up method as defined in claim 1 wherein the fluidized reaction zone is a fast-fluidized reaction zone containing a dense phase catalyst reactor section and a catalyst disengagement section that contains an inventory of catalyst particles and wherein catalyst circulation is initiated in step g) by opening a slide valve in a catalyst recirculation standpipe providing a conduit between the disengagement section and the dense phase reactor section.

5. The start-up method as defined in claim 1 wherein step g) is performed with a fluidized reaction zone that does not initially contain catalyst, where the fluidized reaction zone comprises a dense phase reactor section and a catalyst disengagement section and where step g) is performed in two sub-steps:

a) adding catalyst to the fluidized reaction zone via a catalyst inlet standpipe which is in communication with the dense phase reactor section until the required inventory of catalyst accumulates in the disengagement zone; and
b) opening a slide valve in a recirculation standpipe providing a flow conduit between the disengagement zone and the dense phase reaction zone.

6. The start-up method as defined in claim 1 wherein the fluidized conversions zone is a fast-fluidized reactor having the configuration shown in FIG. 2.

7. The start-up method as defined in claim 6 where the superficial velocity required for effective separation of the catalyst in the one or more cyclones is about 10.7 to 16.8 m/sec(35 to 55 ft/sec).

8. The start-up method as defined in claim 6 wherein the product compression zone contains one or more variable speed centrifugal compressors having relatively flat performance curves.

9. The start-up method as defined in claim 1 where the product compression zone is designed to handle only about 30 to 40% of the volume of the effluent gas stream exiting the fluidized reactor at design capacity.

10. The start-up method as defined in claim 1 where the process is an MTO process and where the feed contains methanol.

11. The start-up method as defined in claim 10 where the catalyst comprises SAPO-34.

12. A method of starting up a catalytic MTO process comprising a fluidized MTO reactor zone containing one or more cyclones requiring a minimum superficial gas velocity in order to function properly, an effluent quench zone, a motor-driven product compression zone that is sized to handle only about 20 to 60 vol-% of the MTO reaction zone effluent gas stream at design capacity and that cannot provide the required superficial linear velocity for the fluidized MTO reaction zone and a light olefin and oxygenate recovery zone, where the start-up is conducted without the use of an additional

motor-driven start-up compressor and with the use of a thermal compressor having a motive gas inlet, a suction gas inlet, and a discharge gas outlet, the start-up method comprising the steps of:

a) charging the MTO reaction zone with an inert start-up gas in an amount sufficient to provide effluent gas stream for recirculation;

b) passing a first portion of the resulting effluent gas stream to the product compression zone and compressing it therein to provide a high pressure gas stream;

c) heating at least a first portion of the high pressure gas stream, charging the resulting heated high pressure gas stream to the motive gas inlet of the thermal compressor to produce a discharge gas stream and recycling the resulting discharge gas stream from the thermal compressor back to the MTO reaction zone thereby establishing a first start-up gas circuit;

d) passing a second portion of the effluent gas stream from step a) directly to the suction gas inlet of the thermal compressor, compressing the second portion using energy contained in the motive gas and passing the resulting compressed gas into the discharge gas stream thereby establishing a second start-up gas circuit;

e) increasing the temperature of the heated high pressured gas stream until the temperature of the MTO reaction zone reaches at least about 300° to 400°C (572° to 752°F);

f) increasing the pressure of the discharge gas stream until the pressure differential across the MTO reaction zone is sufficient to drive the discharge gas stream there through at a velocity which meets or exceeds the minimum cyclone superficial gas velocity;

g) start circulating catalyst particles in the MTO reactor zone using the discharge gas stream from the thermal compressor as the fluidizing gas and charging a minor amount of the methanol feed to the MTO reaction zone while contacting a quenching medium in the quench zone with the effluent gas stream in order to condense stream contained therein and while passing a commensurate second portion of the high pressure gas stream produced in step b) into the light olefin and oxygenate recovery zone; and

h) increasing the amount of the methanol feed charged to the MTO reaction zone while simultaneously decreasing the amount of the first portion of the high pressure gas stream passed into the first start-up gas circuit until the desired flow rate of the methanol feed into the MTO reaction zone is established and the thermal compressor is blocked off.

13. The start-up method as defined in claim 12 wherein the inert start-up gas is selected from the group consisting of nitrogen, hydrogen, carbon dioxide, argon, neon, helium, methane, ethane and mixtures thereof.

14. The start-up method as defined in claim 12 wherein a high pressure steam is injected into the motive gas inlet of the thermal compressor in admixture with the heated

high pressure gas stream once the temperature of the MTO reaction zone reaches a level of about 300° to 400°C (572° to 752°F).

15. The start-up method as defined in claim 12 wherein the active ingredient of the fluidized catalyst comprises SAPO-34.

16. The start-up method as defined in claim 15 wherein the catalyst comprises SAPO-34 in admixture with an inert binder and/or filler in an amount sufficient to comprise about 5 to 40 mass-% thereof.

17. The start-up method is defined in claim 12 wherein the fluidized MTO reaction zone is a fast-fluidized reaction zone containing a dense phase catalyst reactor section and a catalyst disengagement section that contains an inventory of catalyst particles and wherein catalyst circulation is initiated in step g) by opening a slide valve in a catalyst recirculation standpipe providing a conduit between the disengagement section and the dense phase reactor section.

18. The start-up method as defined in claim 12 wherein step g) is performed with a fluidized MTO reaction zone that does not initially contain catalyst, where the fluidized MTO reaction zone comprises a dense phase reactor section and a catalyst disengagement section and wherein step g) is performed in two sub-steps:

a) adding catalyst to the fluidized reaction zone via a catalyst inlet standpipe which is in communication with the dense phase reactor section until the required inventory of catalyst accumulates in the disengagement zone; and
b) opening a slide valve in a recirculation standpipe providing a flow conduit between the disengagement zone and the dense phase reaction zone.

19. The start-up method as defined in claim 12 wherein the fluidized MTO conversion zone is a fast-fluidized reactor having the configuration shown in FIG. 2.

20. The start-up method as defined in claim 19 where the superficial velocity required for effective separation of the catalyst in the one or more cyclones is about 10.7 to 16.8 m/sec (35 to 55 ft/sec).

21. The start-up method as defined in claim 19 wherein the product compression zone contains one or more variable speed centrifugal compressors having relatively flat performance curves.

22. The start-up method as defined in claim 19 where the product compression zone is designed to handle only about 30 to 40% of the volume of the effluent gas stream exiting the fast-fluidized reactor at design capacity.